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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| EXAMINER |
|---|
| MOONEYHAM, JANICE A |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3629 | |

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/825,451 | CHAMPERNOWNE, ARTHUR FRANCIS |
| | Examiner | Art Unit |
| | Jan Mooneyham | 3629 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 May 2004*.

2a)☐ This action is **FINAL**.        2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail. Date _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 1-04)     Office Action Summary     Part of Paper No./Mail Date 041203

## DETAILED ACTION

1.      This is in response to the applicant's communication filed on May 13, 2004, wherein:

Claims 1-36 are currently pending;

Claims 1 and 25 have been amended;

No claims have been added or canceled.

### *Continued Examination Under 37 CFR 1.114*

2.      A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on May 13, 2004 has been entered.

### *Response to Amendment*

### *Claim Rejections - 35 USC § 112*

3.      The rejection as to Claims 1-12 and 25-36 under the second paragraph of 35 USC 112 is

hereby *withdrawn.*

### *Claim Rejections - 35 USC § 101*

4.      The rejection as to Claims 1-12 and 25-36 as being rejected under 35 U.S.C. 101 is hereby

*withdrawn.*

### *Claim Rejections - 35 USC § 102*

The text of those sections of Title 35, U.S. Code not included in this action can be found

in a prior Office action.

**5.    Claims 1, 3, 9, 10, 13, 15, 21,22, 25, 27, 33, and 34 are rejected under 35**

**U.S.C. 102(e) as being anticipated by DeMarcken et al. (US Patent No. 6,295,521)**

**(hereinafter referred to a DeMarcken).**

**Referring to Claims 1, 13, and 25:**

DeMarcken discloses a method and system for finding at least one best fare for a trip, the

method comprising:

At the query server computer, in response to a fare query received from the client

application (col. 1, lines 48-56, col. 3, line 55 thru col. 4, line 41, Figs. 2-3, 18, 19)

determining a set of partial fare solutions for the trip (Figs 1-18, col. 51 – Finding the Best Price,

see line 26-29 – (partial) pricing solutions,  col. 55, lines 51-56);

adding trip information to the partial fare solutions in order to define a set of complete fare

solutions for the trip (Figs. 19-27, col. 4, lines 43-51, col. 5, lines 1-4, see also, col. 49, lines 30-

44, col. 51, lines 35-55, Fig. 3);

as trip information is added to the partial fare solutions, eliminating partial fare solutions that are

non-optimal partial solutions (col. 5, lines 4-6- see also, col. 49, line 30 thru col. 50, line 39, Fig.

19, col. 2, lines 27-37, col. 53, line 25 thru col. 54, line 34, col. 55, lines 48-62); and

returning a subset of said complete fare solutions as the best fares for the trip (Fig. 19, col. 1, line

46 thru col. 2, line 51,  col. 49, lines 30-59, col. 51- Finding the Best Pricing Solution, col. 55

47-62).

**Referring to Claims 3, 15, and 27:**

DeMarcken discloses the method and system of claims 1, 13 and 25, wherein said subset

of complete fare solutions is a predetermined number of lowest cost fare solutions (col. 2, lines

31-37, col. 4, lines 30-41, col. 6, lines 16-19, see also col. 28, line 60 thru col. 29, line 3, col. 29,

lines 63-67- deferred rules, Fig. 4B, Fig. 19, it can be inferred that a subset can have a

predetermined number of lowest cost fare solutions, col. 49, lines 30-59, col. 51, lines 3-55, col.

52- Finding Minimum Value).

**Referring to Claims 9, 10, 21, 22, 33, and 34:**

DeMarcken discloses the method and system of claims 1, 13 and 25 wherein said partial

fare solutions are stored in a priority queue, said complete fare solutions are retrieved from a

priority queue (cols. 55-61–Enumerating Pricing Solutions).

### *Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found

in a prior Office action.

6.      **Claims 2, 14, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over**

**DeMarcken.**

**Referring to Claim 2, 14, and 26:**

DeMarcken discloses the method and system of claims 1, 13, and 25, wherein adding trip

information comprises:

supplying a fare query to a root node in a solution tree (col. 1, lines 46-65, col. 7, lines 16-18,

Figs. 2 (48), 3, 3A, 3B, see also, col. 5, lines 36-45);

assigning fare components corresponding to said root node to a plurality of

nodes (Figs. 2 - faring process (18), 3, 3A, 3B, , col. 1, line 46-65, col. 2, lines 38-51, col. 15,

lines 55-66 Fig. 3A);

assigning at least one carrier corresponding to said nodes to a plurality of nodes (Fig. 3A (UA

(United Airline, NW (North West), Fig. 6, (114);

assigning at least one flight corresponding to said nodes to a plurality of nodes (Fig. 3, US Bos –

LAX Rt QE7NR, Bos-San UAA515), Fig. 2, scheduler processor (16), col. 3, lines 55-66, see

also, col. 14, lines 1-6);

assigning at least one priceable unit corresponding to said nodes to a

plurality of nodes (pricing solution, col. 3, lines 55-66); and

assigning at least one fare corresponding to said nodes to a plurality of leaf nodes (Fig.3A, 3B,

Fig. 4A (fares or each faring atom, Col. 10 – The Faring System- Fig. 19).

DeMarcken does not disclose assigning the fare components to a plurality of first nodes,

at least one carrier to a plurality of second nodes, at least one flight corresponding to a plurality

of third nodes, assigning at least one pricable unit to a plurality of fourth nodes, and assigning at

least one fare corresponding to a plurality of leaf nodes.

However, Demarcken discloses a data structure comprising a plurality of nodes that can

be logically manipulated using value functions and a graph that contains nodes that can be

logically manipulated or combined to extract a plurality of pricing solutions. (col. 2, lines 38-

51). It would have been obvious to ordinary skill in the art to arrange DeMarcken's method and

system to include the assignment of nodes as set forth in Claim 2, 14, 26 since DeMarcken 's

system and method discloses a data structure comprising a plurality of nodes which can be

logically manipulated or combined and this would include assigning the nodes as set forth

Claims 2, 14, and 26.


**7.      Claims 4-8, 11,12, 16-20, 23,24, 28-32, 35, and 36 are rejected under 35 U.S.C. 103(a)**

**as being unpatentable over DeMarcken as applied to claims 1, 13 and 25 above, and further**

**in view of Sabre, Inc. (PCT WO 01/29693), (hereinafter referred to as Sabre).**

**Referring to Claims 4, 16 and 28:**

Demarcken discloses the method, medium and system of claims 1, 13 and 25.

DeMarcken does not disclose wherein said subset of complete fare solutions is an exhaustive set

of said complete fare solutions.

However, Sabre discloses a method and system wherein the subset of complete fare

solutions is an exhaustive set of complete far solutions (col. 2, lines 18-19, col. 3, lines 1-2, page

4, lines 17-22).

It would have been obvious to one of ordinary skill in the art to incorporate into the

method and system of DeMarcken the teachings of Sabre so as to provide the lowest fare across

a wide range of airlines and itineraries (page 3, lines 1-2)

**Referring to Claims 5, 17, and 29:**

Sabre further discloses the method, medium and system of claims 1, 13 and 25, wherein

adding trip information and eliminating partial fare solutions are performed in a recursive

manner (page 9, lines 13-14, page 10, lines 2-4).

**Referring to Claims 6, 18, and 30:**

Sabre further discloses the method, medium and systems of claims 1, 13, and 25, wherein adding trip information and eliminating partial fare solutions are performed in an iterative manner (page 9, lines 18-22).

**Referring to Claims 7, 19, and 31:**

Sabre further discloses the method, medium and systems of claims 1, 13, and 25, wherein said partial fare solutions are eliminated based on a threshold cost (page 4, lines 17-23, page 9, lines 6-17, page 11, lines 16-18).

**Referring to Claims 8, 20, and 32:**

Sabre further discloses the method, medium and system of claims 1, 13, and 25, wherein said partial fare solutions are eliminated based on a refined lower bound (page 9, line 6 thru page 12, line 11).

**Referring to Claims 11, 23, and 35:**

Sabre further discloses the method, medium and system of claims 1, 13 and 25 wherein adding trip information and eliminating partial fare solutions are performed as part of a branch-and-bound best fare search routine (page 10, lines 4-10).

**Referring to Claims 12, 24, and 26:**

Sabre further discloses the method, medium and system of claims 1, 13, and 25, wherein adding trip information and eliminating partial fare solutions are performed both backward and forward from a destination and origin (page 3, lines 13-18).

### *Response to Arguments*

8.    Applicant's arguments filed on May 13, 2004 have been fully considered but they are not

persuasive.

Regarding applicant's arguments as to Claims 1,13, and 25, applicant states that

"DeMarcken et al. fails to teach determining a set of partial fare solutions," "Demarcken fails to

teach adding trip information to partial fare solutions" and "DeMarcken fails to teach

eliminating partial fare solutions that are non-optimal as trip information is added." The

examiner respectfully disagrees with this argument.

DeMarcken discloses a set of partial fare solutions (see col. 51, lines 26-29 *The inner-*

*value of a node is the best possible value of the function F on the set of (partial) pricing-*

*solutions represented by the node*, col. 55, lines 51-63, Figs. 3A, 3B).

DeMarcken discloses adding trip information to the partial fare solutions (see col. 4, lines

43-51 – *server process 18 is responsive to a user input query. The user input query would*

*typically include minimal information needed to determine a set of pricing solutions. This*

*information typically requires at a minimum, an origin and a destination for travel. In addition*

*the information could also include times, dates and so forth*, col. 49, lines 30-44, Fig. 3, col. 5,

lines 36-45). Also, see column 49, lines 33 through - *a user query 302 that passes parameters*

*into a process 304 and a value function 306 to extract from the pricing graph 38' certain*

*pricing solutions 308 that satisfy parameters specified by the user query.*

DeMarcken discloses eliminating partial fare solutions that are non-optimal as to trip

information added (Fig. 18, Fig. 19, col. 51, lines 51-55, *The Best Price algorithm efficiently*

*finds the cheapest (best) by starting at the "bottom" of the pricing graph 38' and constructing*

*the best solution from each node by looking at the best solution of its children. In this way it*

*works in one pass from the bottom of the graph to the top. At the end of the process the root*

*node contains the best pricing solution for the entire pricing graph,* col. 2, lines 27-37). Every

time your reach another node, you are adding trip information (see Fig. 3A). This, if

DeMarcken works by constructing the best solution from each node then it is understood that

the less optimal or non-optimal are discarded. Furthermore, the applicant is directed to column

2, lines 27 – 37 - *The client process including a manipulation process that manipulates the set*

*of pricing solutions in the form of the directed acyclic graph representation in **response to user***

***preferences.** The manipulation process includes **a pruning process responsive to user***

***preferences** that alters the directed acyclic graph representation in such a manner so as to*

*eliminate undesirable pricing solutions and an enumeration process responsive to user*

*preferences that produces a sorted subset of the pricing solutions represented in the directed*

*acyclic graph.*

DeMarcken further discloses an additive process for defining completed solutions. The

applicant is directed to column 51, lines 13 through 19 wherein DeMarcken discloses a Best

Price algorithm which *efficiently finds the cheapest (best price by staring at the "**bottom**"* of

*the pricing graph and constructing the best solution for each node by looking at the best*

*solution of its children. In this way, it works in one pass from the bottom of the graph to the*

*top. At the end of the process the root node contains the best pricing solution for the entire*

*pricing graph.*

DeMarcken discloses that the set of pricing solutions is obtained from the server in response to a user request (col. 4, lines 30 through 41 (*the set of pricing solutions 38 is obtained from the server 12 in response to a user request....*

The applicant states on page 16 of the response that "it should be understood that this DAG is merely a compressed representation of the tens of millions to hundreds of billions of complete solutions generated by the scheduler process, which complete solutions include both optima and non-optimal solutions." The applicant is directed to column 49 line 29 (MANIPULATING THE PRICING-GRAPH) through column 51, line 55. The Examiner also attaches two definitions of Directed Acyclic Graphs retrieved from a Google search on the Internet.

The applicant makes many assertions. However, the Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

As for Claims 3, 9,10, 15, 21,22, 27, 33 and 34, the applicant argues that since the claims depend on Claims 1,13, and 25, that DeMarcken fails to disclose each element of those dependent claims. Examiner refers the applicant to the response to applicant's arguments as to Claims 1,13, and 25 above. Furthermore, column 2, lines 27-37 and column 49, lines 41-44 state that *the manipulation process includes a **pruning process responsive to user preferences** that alters the directed acyclic graph representation in such a manner so as to eliminate undesirable pricing solutions and an enumeration process responsive to user preferences that **produces a***

*sorted subset of the pricing solutions* represented in the directed acyclic graph. *The pricing*

*solutions list 308 will contain pricing solutions extracted from the pricing graph 38' in*

*accordance with user specified parameters from the user query 302 using one of the process 304*

*and one of the value functions* See also column 51, lines 13 through 55 – *The Best Price*

*algorithm 312a efficiently finds the cheapest (best) price.*

As to Claims 2, 14, and 26, applicant argues that Demarcken fails to disclose adding trip

information to partial fare solutions to define complete fare solutions and that Demarcken

discloses a subtractive process rather than an additive process. The examiner respectfully

disagrees. DeMarcken teaches a adding trip information into the partial fare solution and also

teaches an additive process (col. 49, lines 30-44, col. 50, lines 63-66, col. 51, lines 7-45).

DeMarcken discloses supplying a fare query to a root node in a solution tree (Figs. 3-3B),

assigning fare components , assigning at least one carrier (UA, NW) assigning a flight (Fig. 3A),

assigning at least one priceable unit and assigning at least one fare. The applicant is directed to

the Examiners discussion in the above rejection.

Regarding Claims 4-8, 11-12, 16-20, 23-24, 28-32, and 35-36, the applicant argues that

these each depend from one of independent Claims 1,13, or 25 and must be read in combination

with the independent claims from which they depend. The applicant then argues that

DeMarcken fails to teach or disclose the elements of these dependent claims for the reasons

described with regard to Claims 1,13, and 25. The Examiner directs the applicant to the response

to applicant's arguments as to Claims 1, 13, and 25.

Regarding Claims 4, 16, and 28, the applicant argues that Sabre fails to teach that the

'subset of complete fare solutions is an exhaustive set of said complete fare solutions." The

examiner respectfully disagrees with the applicant.   The motivation behind Sabre is to

efficiently search for the lowest fare across a wide range of airlines and itineraries (page 3, lines

1-2). Sabre states the search technique of the present invention provides efficient searches by

using a combination... thus enabling it to implicitly enumerate the search space.  In this manner,

a large number of possibilities can be considered without actually generating them explicitly.

The examiner directs the applicant to page 4, lines 17-23.  The examiner also directs the

applicant to its own specification (page 13, lines 9-12, page 14, lines 11-15, See also Fig. 2

(210)).  Applicant is reminded that Sabre is combined with DeMarcken.  Applicant is directed to

col. 51, lines 3-55 – more specifically, lines 7-12).

Regarding Claims 5, 17, and 29,

Applicant is reminded that Claims 5, 17, and 29 depend on Claims 1, 13 and 25 which

have been discussed above as to the element of adding trip information and eliminating partial

fare solutions.  Sabre teaches the recursive manner (page 9, lines 13-14, page 10, lines 2-4)

Regarding Claims 6, 18, and 30, applicant is reminded again that these claims depend on

Claims 1, 13 and 25.  Sabre teaches the iterative manner (page 9, lines 18-22)

Regarding Claims 7, 8, 11, 19, 20, 23, 31, 32 and 35, Sabre in combination with

DeMarcken teach a said partial fare solution eliminated based on a threshold cost (page 4, lines

17-23, page 9, lines 6-17, page 11, lines 16-18), wherein said partial fare solutions are eliminated

based on a refined lower bound (page 9, line 6 thru page 12, line 11, and wherein adding trip

information and eliminating partial fare solutions are performed as part of a branch-and bound

best fare search routing (page 10, lines 4-10, also, see page 11, lines 3-11)
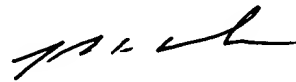
Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jan Mooneyham whose telephone number is (703) 305-8554.

The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Weiss can be reached on (703) 308-2702. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

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jm

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